UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,803	07/02/2001	John William Harper	STL920000104US1	2493

7590 02/12/2004	**EXAMINER**
Michael E. Hudzinski	CHEN, CHONGSHAN
FAY, SHARPE, FAGAN,	

	ART UNIT	PAPER NUMBER
MINNICH & McKEE, LLP	2172	6
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DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 November 2003*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9-17 and 24* is/are rejected.

7)☐ Claim(s) *7,8 and 18-23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, see page 12, lines 2-4, filed on 17 November 2003, with respect

to the rejection(s)of claim(s) 1 under 102(e) have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new

ground(s) of rejection is made in view of Shatdal (6,564,221). Brin does not explicitly disclose

the random sampling facility is integrated into a database management system. Shatdal teaches

the random sampling facility is integrated into database processing (Shatdal, col. 2, lines 34-35).

Please see the detailed rejection.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brin et

al. ("Brin", 6,185,559) in view of Shatdal (6,564,221).

As per claim 1, Brin discloses a method for administration and replication of a database,

comprising the steps of:

providing a database management system with a random sampling facility (Brin, col. 2,

line 67 - col. 3, line 1, A database management system is a computer system involving hardware,

software, or both that provides a systematic approach to creating, storing, retrieving and

processing information stored in a database ((IEEE 100 The Authoritative Dictionary of IEEE

Standards Terms). Brin reports the Toivonen method randomly picks a sampling record from the

database (Brin, col. 2, line 67 - col. 3, line 1). Clearly, the Toivonen's system has a database

management system in order to enable the random sampling process to pick record from the

database.); and

executing said random sampling facility to perform a replication operation on said

database (Brin, col. 6, lines 4-7).

Brin does not explicitly disclose the random sampling facility is integrated into a

database management system. Shatdal teaches the random sampling facility is integrated into

database processing (Shatdal, col. 2, lines 34-35). Please see the detailed rejection. Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to

integrate the random sampling facility into the database management system. Integrating the

random sampling facility into the database management system will reduce function calls

between the random sampling facility and the database management system. This will improve

processing speed.

As per claim 15, Brin discloses a database management system (DBMS) for managing an

associated database, the DBMS comprising:

random sampling facility (Brin, col. 2, line 67 – col. 3, line 1);

database replication tools (Brin, col. 6, lines 4-7).

Brin does not explicitly disclose first database analysis tools using said integrated random

sampling facility for generating extrapolated reports on database content; second database

analysis tools using said integrated random sampling facility for generating extrapolated reports

on database size. However, Brin discloses using random sampling to determine the pattern of the database (Brin, col. 3, lines 1-4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a random sampling to generate extrapolated reports on database content and size in order to determine the pattern or structure of the database. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to generate extrapolated reports on database content and size in order to determine the pattern or structure of the database.

Brin does not explicitly disclose the random sampling facility is integrated into a database management system. Shatdal teaches the random sampling facility is integrated into database processing (Shatdal, col. 2, lines 34-35). Please see the detailed rejection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the random sampling facility into the database management system. Integrating the random sampling facility into the database management system will reduce function calls between the random sampling facility and the database management system. This will improve processing speed.

4.   Claims 2-6, 9-12, 14, 16-17 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brin et al. ("Brin", 6,185,559) in view of Shatdal (6,564,221) and further in view of Hogg and Craig ("Hogg", "Introduction to Mathematical Statistics", 5th ed.).

As per claim 2, Brin and Shatdal teach all the claimed subject matters as discussed in claim 1, except for explicitly disclosing defining a database record sample size S; randomly sampling S records of the database using said random sampling facility; storing statistics for each of said S records, wherein said statistics include a record key for each record; and producing an

extrapolated replication partition analysis based on said statistics. Hogg discloses a random

sampling algorithm that defining a database record sample size S; randomly sampling S records

of the database using said random sampling facility; storing statistics for each of said S records,

wherein said statistics include a record key for each record (Hogg, page 123). Brin discloses

using random sampling to determine the pattern of the database (Brin, col. 3, lines 1-4). It would

have been obvious to one of ordinary skill in the art at the time the invention was made to

produce an extrapolated replication partition analysis in order to determine the database pattern.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to combine Hogg with Brin in order to use the random sampling algorithm to

determine the pattern or structure of the database.

As per claim 3, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed

in claim 2, and further disclose defining a default sample size; selectively receiving a desired

sample size; and, setting said sample size S as said default sample size when the desired sample

size is not selectively received, and setting said sample size S as said desired sample size when

the desired sample size is selectively received (Hogg, page 123).

As per claim 4, Brin and Shatdal teach all the claimed subject matters as discussed in

claim 1, except for explicitly disclosing defining a database record sample size S; randomly

sampling S records of the database using said random sampling facility; storing statistics for each

of said S records, wherein said statistics include a record key for each record; and producing a

partial replication partition analysis based on said statistics. Hogg discloses a random sampling

algorithm that defining a database record sample size S; randomly sampling S records of the

database using said random sampling facility; storing statistics for each of said S records,

wherein said statistics include a record key for each record (Hogg, page 123). Brin discloses

using random sampling to determine the pattern of the database (Brin, col. 3, lines 1-4). It would

have been obvious to one of ordinary skill in the art at the time the invention was made to

produce a partial replication partition analysis in order to determine the database pattern.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to combine Hogg with Brin in order to use the random sampling algorithm to

determine the pattern or structure of the database.

As per claim 5, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed

in claim 4, and further discloses defining a default sample size; selectively receiving a desired

sample size; and setting said sample size S as said default sample size when the desired sample

size is not selectively received, and setting said sample size S as said desired sample size when

the desired sample size is selectively received (Hogg, page 123).

As per claim 6, Brin discloses a method for database administration and replication,

comprising the steps of:

providing a database management system with a random sampling facility (Brin, col. 3,

lines 22-24).

Brin does not explicitly disclose the random sampling facility is integrated into a

database management system. Shatdal teaches the random sampling facility is integrated into

database processing (Shatdal, col. 2, lines 34-35). Please see the detailed rejection. Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to

integrate the random sampling facility into the database management system. Integrating the

random sampling facility into the database management system will reduce function calls

between the random sampling facility and the database management system. This will improve

processing speed.

Brin does not explicitly disclose selecting a default sample size value S; selectively

receiving a desired sample size value D and setting said default sample size value S to said

desired sample size value D when said desired sample size value D is received; randomly

sampling S records of the database using said random sampling facility; storing statistics for each

of said S records, wherein said statistics include a record key for each record; and producing at

least one of: an extrapolated replication partition analysis based on said statistics; and a partial

replication partition analysis based on said statistics.

Hogg discloses disclose a random sampling algorithm that selecting a default sample size

value S; selectively receiving a desired sample size value D and setting said default sample size

value S to said desired sample size value D when said desired sample size value D is received;

randomly sampling S records of the database using said random sampling facility; storing

statistics for each of said S records, wherein said statistics include a record key for each record

(Hogg, page 123). Brin discloses using random sampling to determine the pattern of the

database (Brin, col. 3, lines 1-4). It would have been obvious to one of ordinary skill in the art at

the time the invention was made to produce an extrapolated or a partial replication partition

analysis in order to determine the database pattern. Therefore, it would have been obvious to one

of ordinary skill in the art at the time the invention was made to combine Hogg with Brin in

order to use the random sampling algorithm to determine the pattern or structure of the database.

As per claim 9, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, and further disclose sorting said stored statistics by key prior to producing said partition analysis (Hogg, page 123).

As per claim 10, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 9, and further disclose accessing all database records in an arbitrary sequence; iteratively filling all of said partitions except the last said partition with said accessed records to a maximum byte count; and, storing remaining accessed records in the last of said partitions (Hogg, page 123).

As per claim 11, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, and further disclose storing statistics includes storing said statistics in a memory (Hogg, page 123).

As per claim 12, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 11, except for explicitly disclosing storing said statistics in said memory in a compressed format. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to store said statistics in said memory in a compressed format in order to save storage space. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to store said statistics in said memory in a compressed format in order to save storage space.

As per claim 14, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, and further discloses at least one index dataspace; at least one key dataspace; and at least one statistics dataspace (Brin, col. 1, line 15 - col. 4, line 37).

As per claim 16, Brin and Shatdal teach all the claimed subject matters as discussed in claim 15, except for explicitly disclosing a pre-configured number S defining a default sample size; a means for selectively receiving a particular number defining a desired sample size and setting said number S equal to said particular number; a means for randomly sampling S records of the database using said random sampling facility; a means for storing statistics for each of said S records, wherein said statistics include a record key for each record; and, a means for producing at least one of: an extrapolated database content analysis based on said statistics; an extrapolated partition analysis based on said statistics; and a partial partition analysis based on said statistics.

Hogg discloses a random sampling algorithm that sets a pre-configured number S defining a default sample size; a means for selectively receiving a particular number defining a desired sample size and setting said number S equal to said particular number; a means for randomly sampling S records of the database using said random sampling facility; a means for storing statistics for each of said S records, wherein said statistics include a record key for each record (Hogg, page 123). Brin discloses using random sampling to determine the pattern of the database (Brin, col. 3, lines 1-4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to produce at least one of: an extrapolated database content analysis; an extrapolated partition analysis; and a partial partition analysis in order to determine the database pattern and structure. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Hogg with Brin in order to use the random sampling algorithm to determine the pattern or structure of the database.

As per claim 17, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 16, and further disclose a means for sorting stored statistics by key prior to producing at least one of said analyses (Hogg, page 123).

As per claim 24, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 16, and further disclose a means for utilizing at least one index dataspace; a means for utilizing at least one key dataspace; and a means for utilizing at least one statistics dataspace (Brin, col. 1, line 15 - col. 4, line 37).

5.   Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brin et al. ("Brin", 6,185,559) in view of Shatdal (6,564,221) in view of Hogg and Craig ("Hogg", "Introduction to Mathematical Statistics", 5th ed.) and further in view of Iyer et al. ("Iyer", 5,179,699).

As per claim 13, Brin, Shatdal and Hogg teach all the claimed subject matters as discussed in claim 6, except for explicitly disclosing defining multiple partition boundaries. Iyer discloses defining multiple partition boundaries (Iyer, col. 2, lines 52-66). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Iyer with Brin and Hogg in order to determine the database's partition size.

Allowable Subject Matter

6.   Claims 7-8 and 18-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record, alone or combination, does not teach or fairly suggest the steps with in combination of elements as recited in claim 7 "generating a table of S number pairs (Y_j, I_j), j=1,2, . . . ,S, wherein all Y and all I are initially set to zero; initializing a reservoir of records to an empty state; setting an index M to said reservoir equal to zero; generating a sequence of N non-repeating random numbers $U_1,U_2, . . . ,U_n$, 0<=U<=1, wherein N is the number of records in the database; and, performing additional steps for each random number U_k generated, k=1,2, . . . ,N, the additional steps including: skipping the next record in the database if U_k is less than the smallest value of Y in said table of number pairs; and, updating the table if a Y less than U_k exists by performing further steps including: setting M equal to its current value plus one; replacing the smallest Y in the table with U_k; setting the I value paired with the smallest Y equal to M; and, storing all or part of the next record of the database in said reservoir of stored records, wherein the current value of M is a reservoir index to said stored record".

The prior art of record, alone or combination, does not teach or fairly suggest the steps with in combination of elements as recited in claim 18 "means for generating a table of S number pairs (Y_j, I_j), j=1,2, . . . ,S, wherein all Y and all I are initially zero; a means for initializing a reservoir of records to an empty state; a means for setting an index M to said reservoir equal to zero; a means for generating a sequence of N non-repeating random numbers $U_1,U_2, . . . ,U_n$, 0<=U<=1, wherein N is the number of records in the database; and, a means, for each random number U_k generated, k=1,2, . . . ,N, comprising: a means to skip the next record in said database if U_k is less than the smallest value of Y in said table of number pairs; and, a means to update the table if a Y less than U_k exists, comprising: a means to set M equal to its current value plus one; a means to replace the smallest Y in the table with U_k; a means to set the I value paired

with the smallest Y equal to M; and, a means to store all or part of the next record of said

database in said reservoir of stored records, wherein the current value of M is a reservoir index to

said stored record".

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Chaudhuri et al. (6,532,485) disclose a sampling for database systems.

Alon et al. (5,950,185) disclose an apparatus and method for approximating frequency

moments.

EcElhiney (5,710,915) disclose method for accelerating access to a database clustered

partitioning.

Lawrence et al. (6,253,300) disclose a computer partition manipulation during imaging.

Contact Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Chongshan Chen whose telephone number is 703-305-8319. The

examiner can normally be reached on Monday - Friday (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John E Breene can be reached on (703)305-9790. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 6, 2004

SHAHID ALAM
PRIMARY EXAMINER